L-8/C-51 Reservoir. DRAFT (9/11/98)

Description of Simulation

Simulation is based on ALTD13R with L-8/C-51 reservoir and its functions (component GGG) completely removed. In ALTD13R, the reservoir covers 1200 acres with a total storage depth of 40 feet. The reservoir is filled with excess water from southern L-8 and C-51 basins. Subsequently the water is released from the reservoir to 1) C-51 when discharges through S-155 are less than 100 cfs (off-peak discharges), and 2) WPB Catchment Area when M-canal stage is 18 feet NGVD or lower.

Assumptions

- L-8/C-51 reservoir is removed
- Excess water diverted to reservoir from L-8 and C-51 basins in ALTD13R is allowed to go to tide.
- Water supply releases to WPB Catchment Area and C-51 from L-8/C-51 reservoir are now routed from other reservoir/ASR systems or Water Conservation Area 1 and Lake Okeechobee.

Summary of Results

The removal of L-8/C-51 reservoir results in the following:

- Decrease in water levels (approx. 0.2 ft.) in WPB Catchment Area, as shown in Figure 1. The decrease is not substantial enough to affect stages in Loxahatchee Slough (Figure 2) or the duration of cutbacks in public water use in Northern Palm Beach County (Figure 3).
- Increase in dependence on WCA-1 and Lake Okeechobee for water supply to Service Area 1 (62 kac-ft/year to 76 kac-ft/year during drought years, 28 kac-ft/year to 38 kac-ft/year over simulation period), as shown in Figures 4 and 5. Figures 4 and 5 also show an increase in recovery from the ASR wells along C-51 with L-8/C-51 reservoir removed. The reservoir provides up to 300 cfs to C-51 when discharges through S-155 are less than 100 cfs, which occurs mostly during the dry season. This in turn decreases the need to recover water from the ASR wells for water supply purposes with the reservoir present, as indicated in Table 1. Note that the total system deliveries to Service Area 1 increase slightly with the reservoir removed. This is because the off-peak discharges the reservoir provided to C-51 are eliminated, resulting in increased demand in SA1.
- As seen in Table 1, 67% of the diversion of excess C-51 water to reservoir in ALTD13R occurs in the wet season while over 75% of the outflow from the reservoir to C-51 occurs in the dry season. Thus, when L-8/C-51 reservoir is removed, nearly 90% of total increase of 52 kac-ft/year in outflow to Lake Worth Lagoon occurs in the wet season. A comparison of mean daily S-155 discharges during the wet seasons of 1968 and 1995 of the simulations is shown in Figures 6 and 7. Injection of excess water into ASR wells along C-51 increases as well in the wet season (Table 1).

Table 1. Average Seasonal Values (thousand acre-feet)

	ALTD13R		NOL8RS	
	Dry Season	**Wet Season**	**Dry Season**	**Wet Season**
Outflow to Lake Worth Lagoon	**75**	**162**	**81**	**208**
C-51 ASR Injection	**38**	**40**	**31**	**47**
C-51 ASR Recovery	**23**	**1**	**31**	**2**
C-51 Diversion to Reservoir	**30**	**61**	**0**	**0**
Reservoir Outflow to C-51 (off-peak discharges)	**65**	**19**	**0**	**0**
L-8 Outflow via C-51 to Tide	**13**	**50**	**20**	**60**

Fig. 1 Stage Duration Curves at WPBWCA (Cell R56 C36)

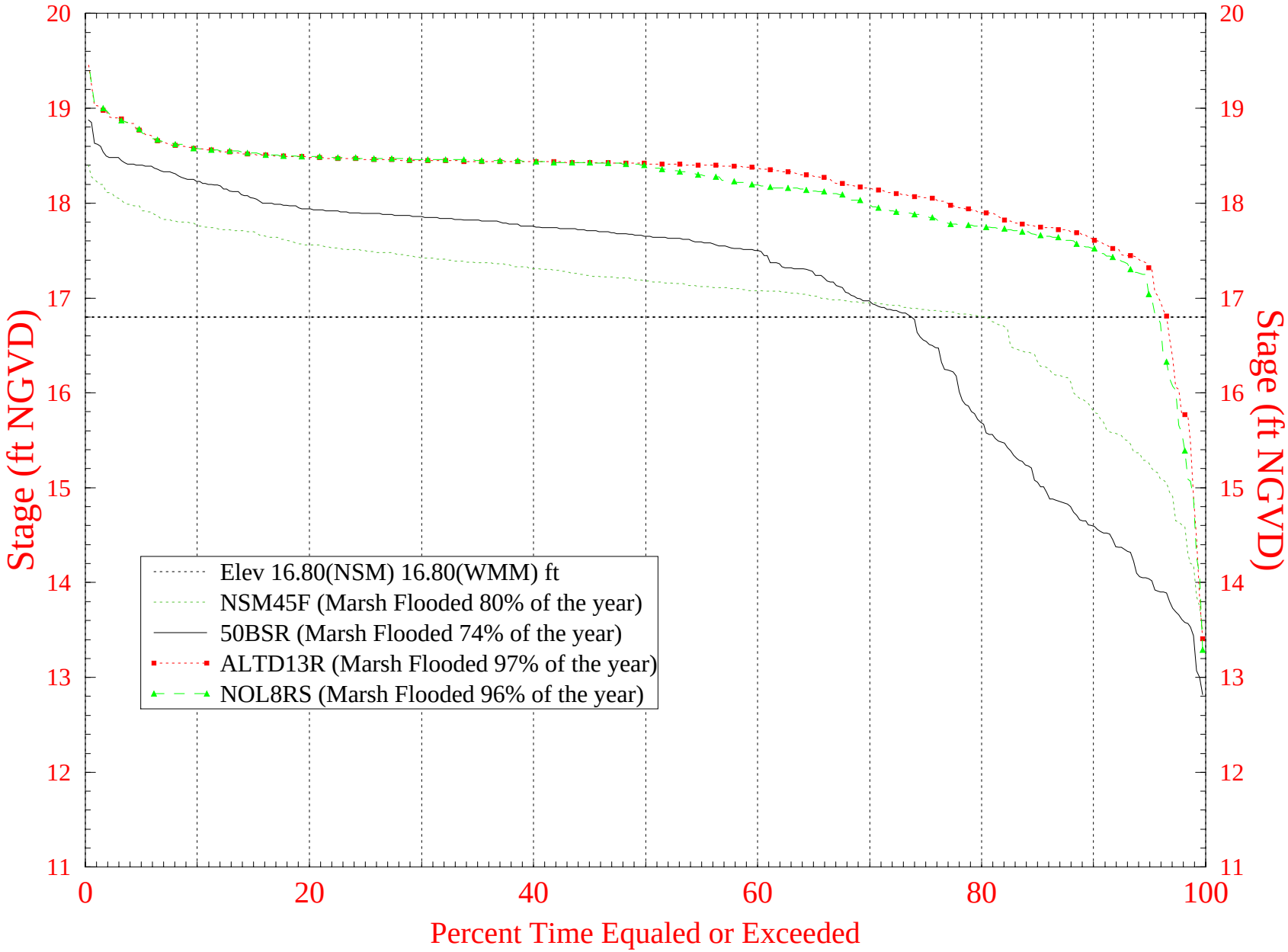

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Fig. 2 Stage Duration Curves at Loxahatchee Slough
SFWMM Cell R59 C36

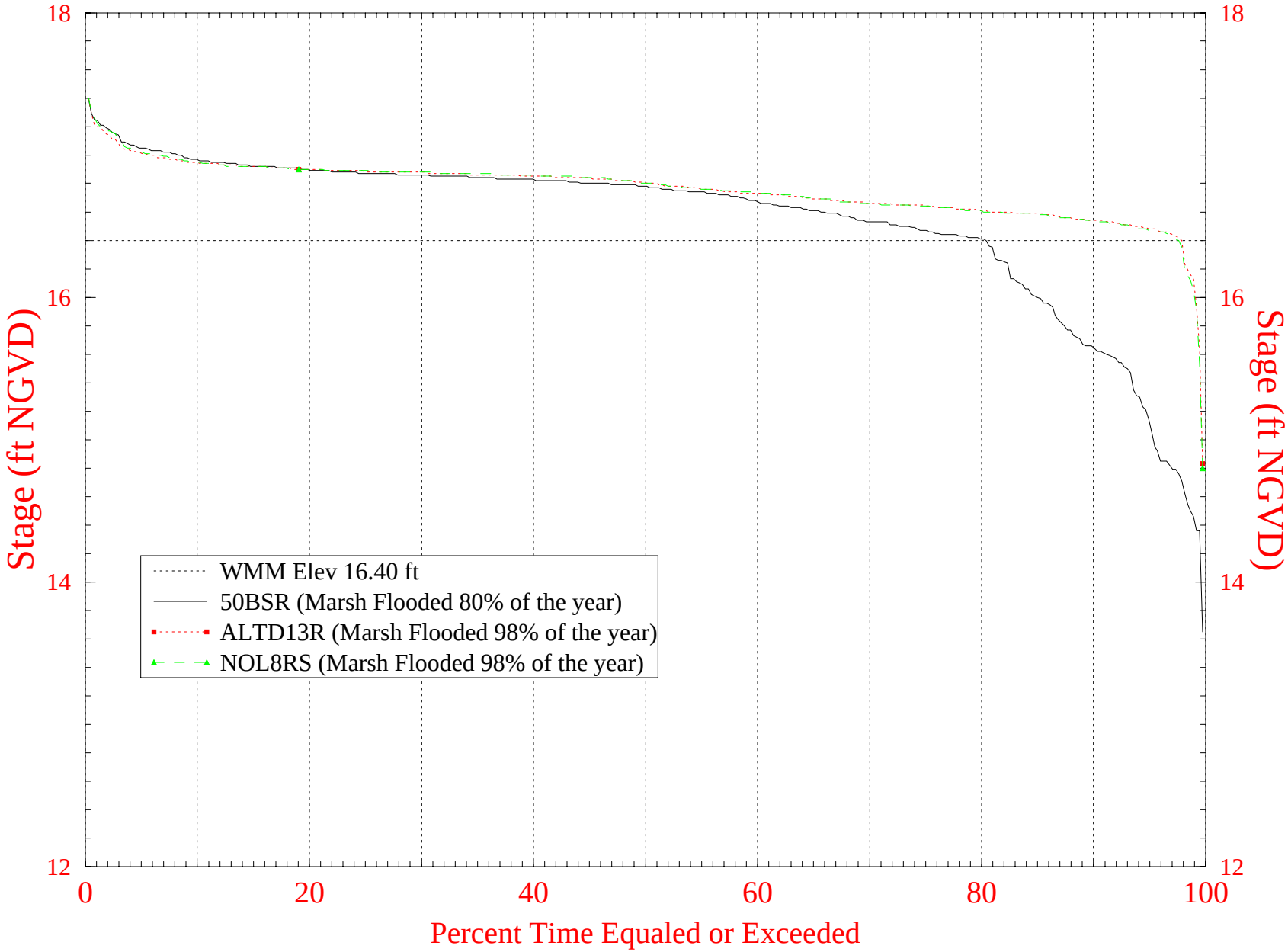

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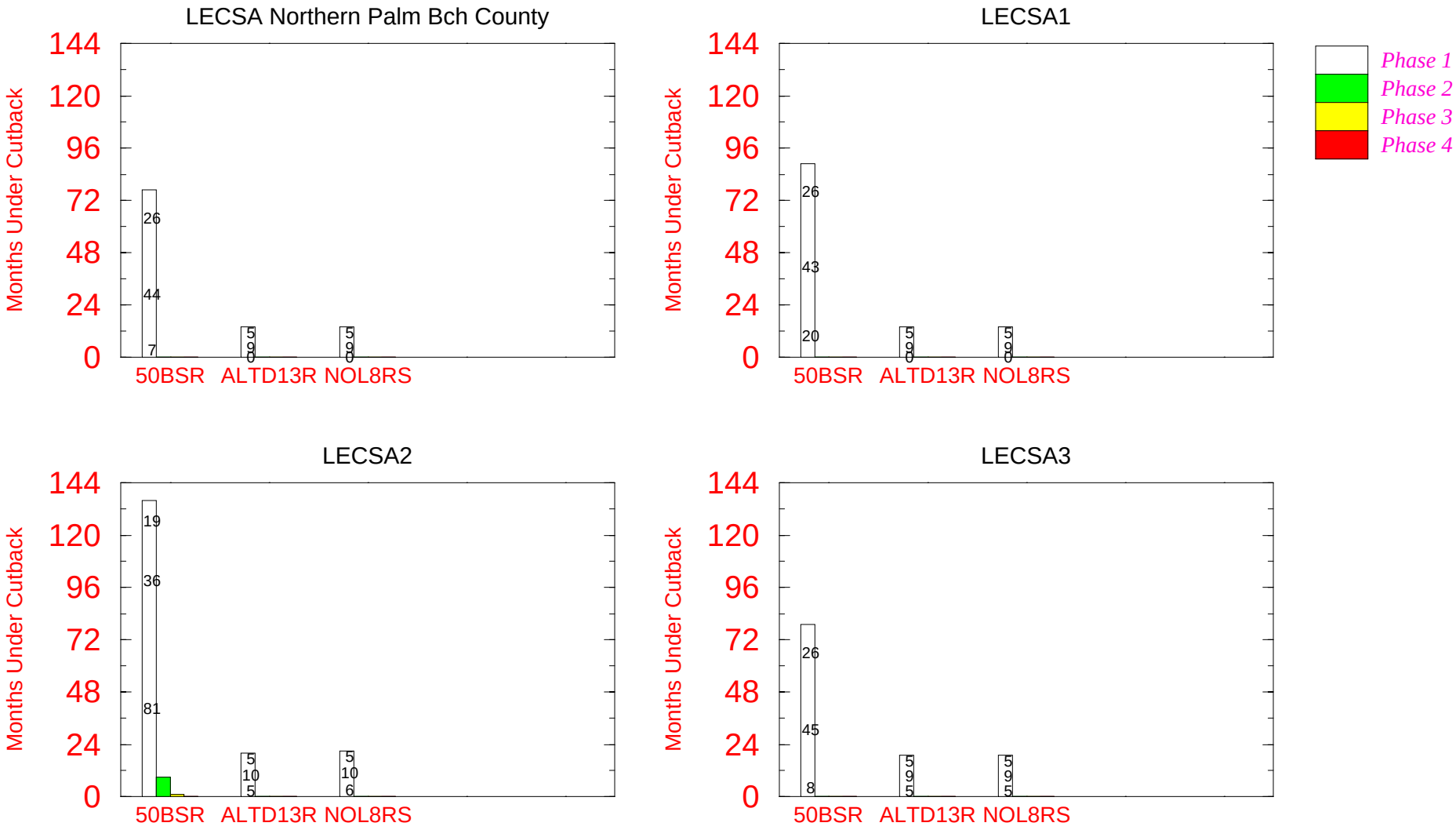
Fig. 3 Number of Months of Simulated Water Supply Cutbacks
for the 1965 − 1995 Simulation Period



Note: Phase 1 water restrictions could be induced by a) Lake stage in Supply Side Management Zone (indicated by upper data label), b) Local Trigger well stages (lower data label), and c) Dry season criteria (indicated by middle data label).

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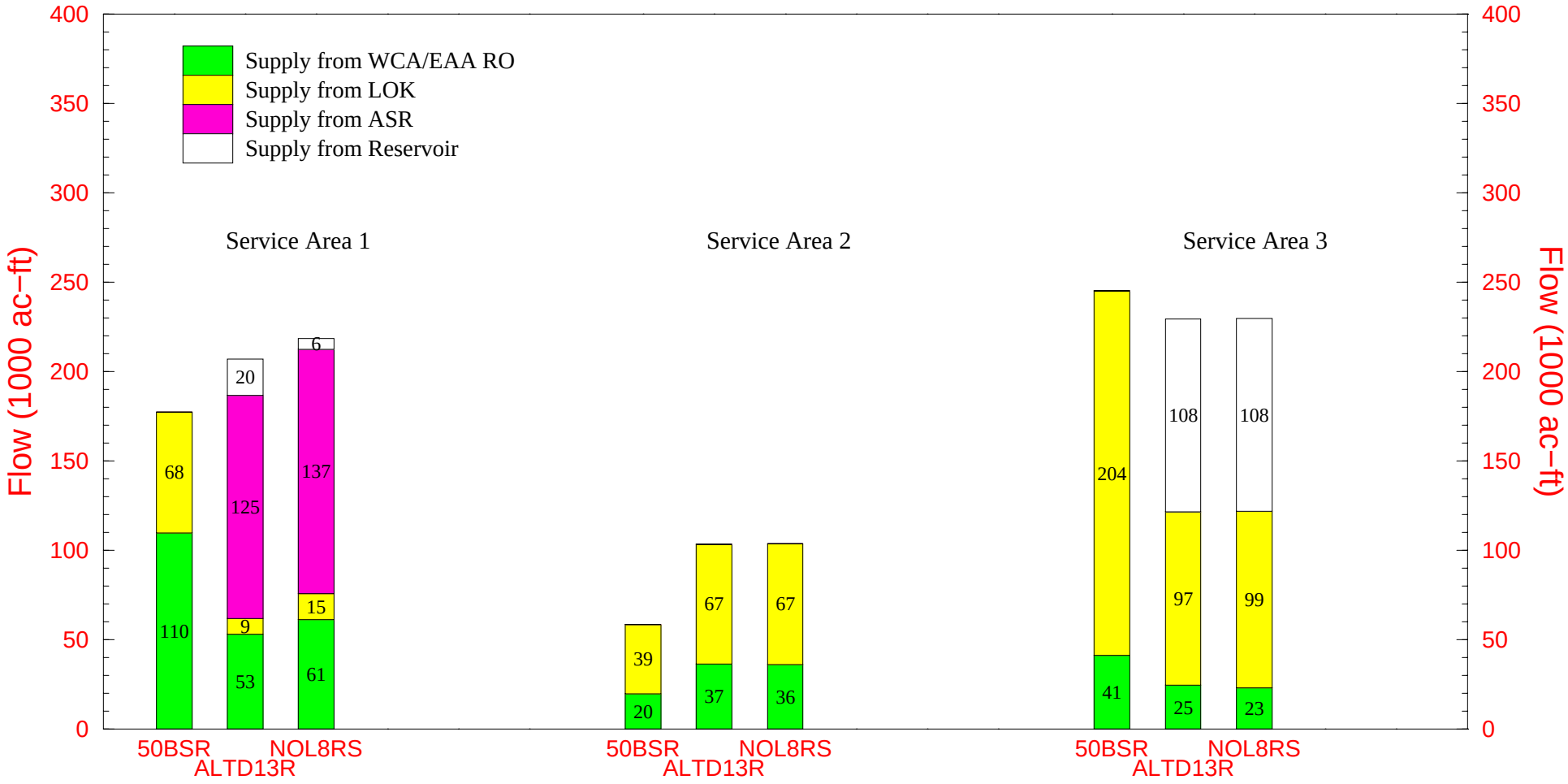
Fig. 4 Mean Annual Regional System Water Supply Deliveries to LEC Service Areas for the five Drought years (71,75,81,85,89)



Note: Structure flows included: SA1=S39+LWDD+ADDSLW+ACMEWS+WSL8S+HLFASR+C51FAS+WSC1+S1ATHL+CPBRWS+BPRL8S
SA2=S38+S34+NNRFAS; SA3=S31+S334+S337+BRDRWS+LBTC6+LBTDBL+LBTL30+LBTSC+LBTC9+LBTC2+C9RWS
Supply RECEIVED from LOK may be less than what is DELIVERED at LOK due to conveyance constraints.
Regional System is comprised of LOK and WCAs.

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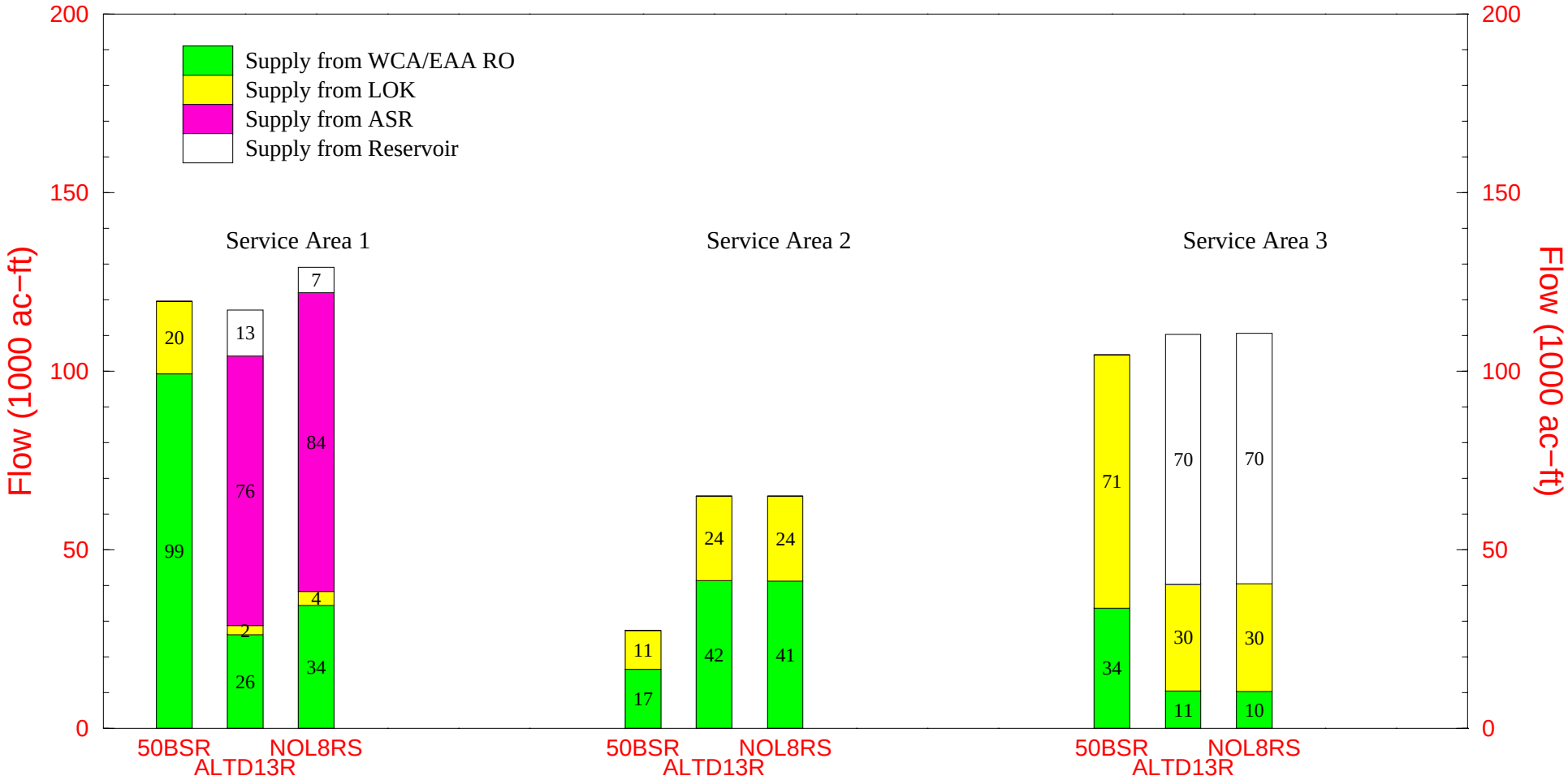
Fig. 5 Average Annual Regional System Water Supply Deliveries to LEC Service Areas for the 1965 – 1995 simulation



Note: Structure flows included: SA1=S39+LWDD+ADDSLW+ACMEWS+WSL8S+HLFASR+C51FAS+WSC1+S1ATHL+CPBRWS+BPRL8S
SA2=S38+S34+NNRFAS; SA3=S31+S334+S337+BRDRWS+LBTC6+LBTDBL+LBTL30+LBTSC+LBTC9+LBTC2+C9RWS
Supply RECEIVED from LOK may be less than what is DELIVERED at LOK due to conveyance constraints.
Regional System is comprised of LOK and WCAs.

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Fig. 6 Comparison of Simulated S−155 Discharge

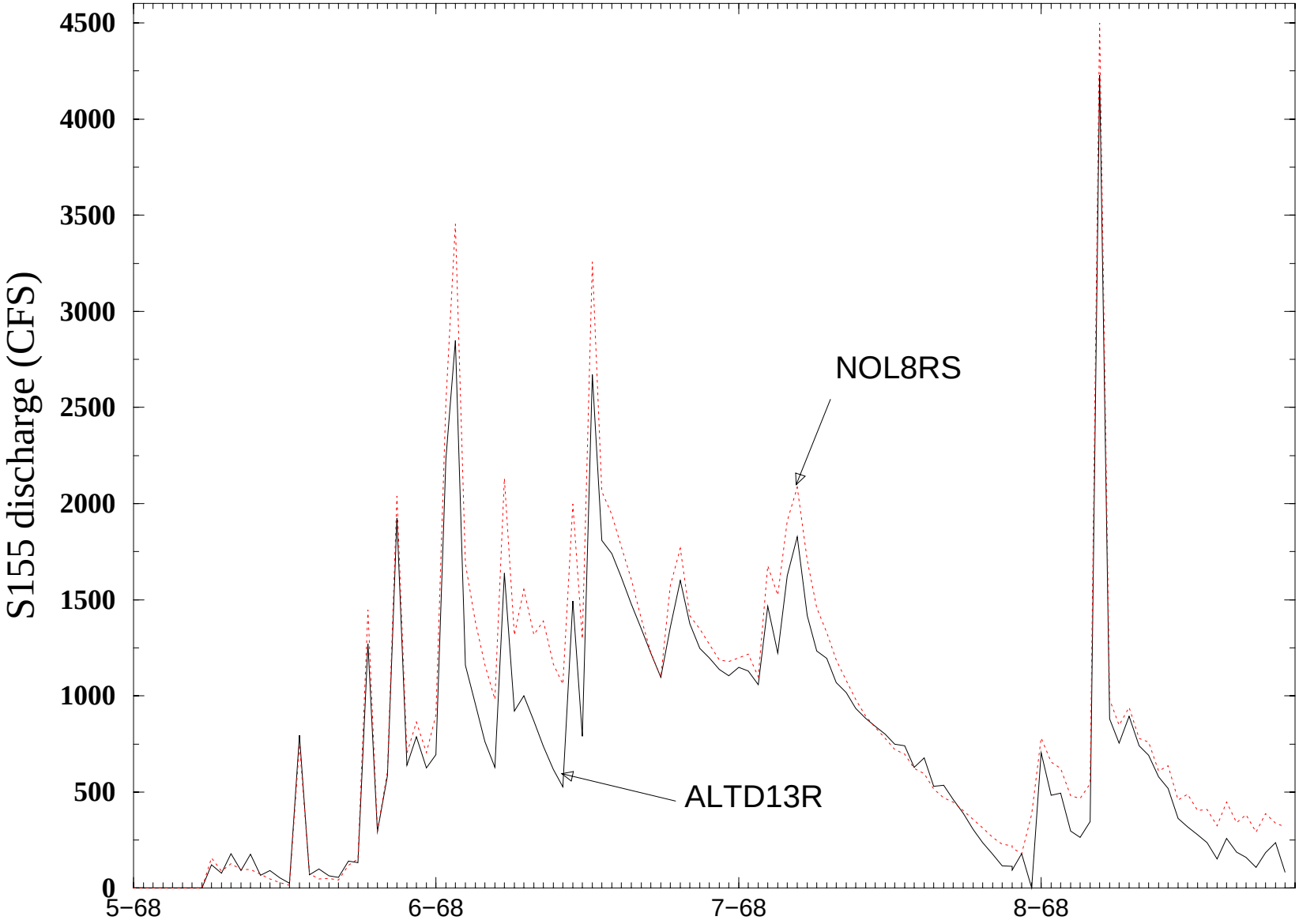

Fig. 7 Comparison of Simulated S−155 Discharge